



## Sustainability 401 Part 2: The Future in a

Part 2: The Future in a Word...Sustainability

#### **Maryland MP3 Meeting**

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## **Learning Objectives**



- There's a problem we are exceeding the earth's capacity to provide resources and absorb wastes
- There's a solution "sustainability" is a framework that balances economy (mission), well-being, and environment



#### We Are Here

- See what some visionary organizations are doing
- Still saving the world and having fun





## Origins of Sustainability i.e., it's not something we made up to torture you ...



- Communities
- Regional Programs
- State Initiatives
- Federal programs
- Corporations and industry



#### Communities



- Whistler, British Columbia
- Sustainable Pittsburgh
- City of Austin Sustainable Communities Initiative
- Chattanooga Venture
- The Livable Tucson Program
- Sustainable Seattle
- Sustainable City, San Francisco
- Sustainable Boston Initiative



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#### **Regional Programs**



- Thomas Jefferson Sustainability Council
- Sustainability Indicators Project for Central Texas
- Clinch Powell Sustainable Development Initiative
- Greater Orlando Region Healthy Communities Initiative



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#### State Initiatives



- Sustainable Washington
- Smart Growth for Colorado's Future
- Maryland Smart Growth Program
- North Carolina Environmental Sustainability Plan
- Florida Sustainable Communities



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#### Federal Programs



- President's Council on Sustainable Development
- EPA Smart Growth Network
- EPA Green Communities
- Federal Highway Administration Transportation and Community and System Preservation Program
- U.S. Interagency Working Group Sustainable Development Indicators
- Department of Energy, Center of Excellence in Sustainable Development
- Federal Sustainability Network

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#### **Corporate Programs**



- Nike
- Starbucks
- Interface
- British Petroleum
- General Motors Corporation
- Saunders Hotel Group
- SwissHôtel
- Silicon Valley Manufacturing Group
- Ford Motor Company
- Scandic Hotels
- Collins Pine

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- these guys are in it for the money
- Ray Anderson quote when my competitors have to pay the true price of oil, I'm going to kick their butts





#### The United States Army -The Journey Begun

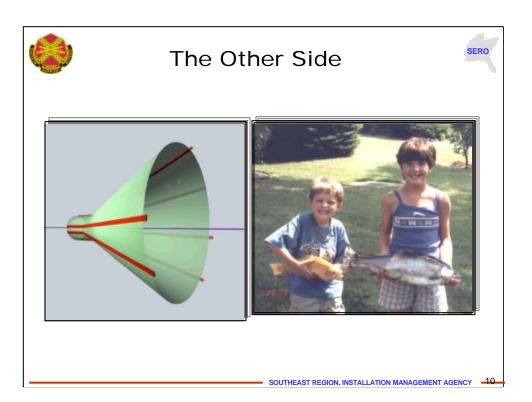
- Facilities
  - Sustainable Design and Development Policy
  - SPiRiT standards
- Ranges
  - Sustainable Range Design R&D Program
- Weapons Systems
  - Green ammunition R&D program
- Installations
  - Installation Sustainability Program
  - Army Compatible Use Buffers/Private Lands Initiatives

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- •The Army has started pursuing sustainable operations in 4 core business processes:
- •Facilities The Army is now pursuing sustainability as part of the design process for the built environment by adapting the Leadership in Energy and Environmental Design (LEED) criteria developed by the U.S. Green Building Council to make it more mission oriented. The sustainable project rating tool (SpiRiT) was developed as a self-evaluation process to help installations and designers quantify and measure the sustainability of infrastructure plans and projects. Army policy now requires all newly designed facilities to achieve at least a gold rating, and many "showcase" projects are underway.
- •G3 has taken the lead in developing a Sustainable Range Plan. Sustainable ranges are clearly vital to realistic training and testing. A comprehensive approach is needed to ensure viability of our ranges for the future, including how we design ranges to prevent the flow of pollutants off them.
- Weapons systems By replacing lead projectiles with tungsten projectiles for small arms, the Army developed ammunition that not only has excellent ballistic characteristics, but one that provides a more environmentally sustainable approach to training. The Army acquisition community is looking at life-cycle environmental costs of various weapon systems. By "designing out" pollution and environmental impact at the front end of the process, we hope to reduce the environmental impact of weapons system through the whole life cycle of manufacture, operation, and disposal.
- On the Installation side of the house, the Installation Sustain ability Program brings together stakeholders from the installation, the community, regulatory agencies, and Army headquarters to form a consensus on long-term sustainability goals specific to that installation and community. I'll talk a little more about that program in a minute.
- •By partnering with the U.S. Fish & Wildlife Service and the Nature Conservancy, Fort Bragg is seeking to provide greater viability of the Fort Bragg and Sand Hills red-cockaded woodpecker populations by establishing the Southern Pines National Wildlife Refuge connecting the two. Increasing access to land for military training is expected to accompany a more viable RCW population. Such an initiative would have been impossible for Ft. Bragg acting independently.

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## **Sustainability - Multiple approaches**

Eco-efficiency
Natural Capitalism
Factor Four, Factor Ten
Biomimicry
Eco-effectiveness
Dematerialization
The Natural Step Framework

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More slides from Mary and Brian Nattrass, Directors of The Natural Step Canada, and authors of...



Dancing with the Tiger
Learning sustainability Step by Natural Step

- -History of The Natural Step organization a Swedish cancer researcher, Karl Henrik Robert, got curious about the increase of childhood cancers, and went seeking a solution
- -There was much the scientific/medical community didn't agree on.
- -So Robert attempted to define what they COULD agree on, working with an international team of scientists.
- -The Natural Step framework was the result and it is now used in 9 countries as the guiding principles that define sustainability.

## **Why The Natural Step Framework?**

Derived from fundamental scientific principles
Simplifies the complexity of systemic environmental issues

Provides a framework for planning and action

Takes a systems perspective

## The Rules of This System



9:30-10:15

#### Basic Science – all scientists agree

Matter and energy do not disappear.

Matter and energy become less ordered, concentrated, and structured.

The quality (usefulness) of matter and energy decreases as it becomes less ordered etc.

Photosynthesis is the major process by which order is produced.

- •Who remembers the basic laws of thermodynamics?
- •Bullet 1 1<sup>st</sup> Law of Thermo everything's gotta be somewhere there is no away
- •Bullet  $2 2^{nd}$  Law entropy
- •As matter and energy disperse, they become less harnessable and useful.
- •The only input to the earth system is energy from the sun. Plants are the only species that can take sunlight and convert it to matter that animals can eat. If all the plants died due to volcanic ash blotting out the sun, for example, as has happened 4 or 5 times in the earth's history all the animals, including us, would die too.
- •OK Who's got a headache?

## **Basic Science - Demonstration**

#### WHO NEEDS SOME CHOCOLATE?

- -Hand out chocolate/cookies
- -Go back one slide, and ask participants what happened to the chocolate.
- -Did it disappear cease to exist? (No, it changed form became stomach contents on it's way to becoming human tissue or byproducts)
- -What happened to it's order, structure, and quality? Is it still a cookie? Where's it going to end up ultimately at its end state or we should say, at your end state.
- -Where did the cookie really come from? (Sunlight that plants captured, turned into wheat, cocoa, and sugar, and grain that chickens and cows ate to produce eggs and milk.
- -So the moral of the story is chocolate is really solid sunlight and so are you.

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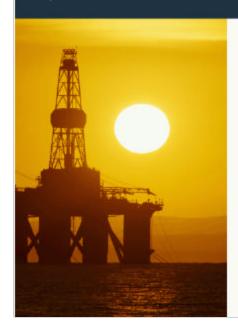
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In a sustainable society, nature is not subject to systematically increasing:

... concentrations of substances extracted from the Earth's crust.

What does this mean? Who's got an example?

- •What the heck does that mean? Can anyone give me an example?
- •Examples:
  - •oil extracted, burned, CO2 air emissions, ozone hole
  - •Oil extracted, spilled, water pollution
  - •Uranium mined, 250,000 year half-life, nature can't handle this stuff

Nattrass translation: This means substituting certain minerals that are scarce in nature with others that are more abundant, using all mined materials efficiently, and systematically reducing dependence on fossil fuels.

#### **System Condition 2** 1 NATURAL STEP In a sustainable society, nature n-toronti metal facility is CONTROL CONTROL CONTROL of level that write has is not subject to systematically n-endoceral n-follocaral n RETONES chicotrificionethers dictionalise scientisms increasing: at knowletters. Inchlordisested has a likely or other transportation of the control of the contro ...concentrations of substances refluienc chloride chlorofeen 1,1.1 - tachlaroottone cartoe tetrachlaride produced by society. + ALCOHOLS trichtmettyline chleropestase rischer bytrofunione 2-auflyf-3-bounce e 4-teptonese dis wood/secretty se s-projected 1-betaest Intrachboothyloni What does this mean? T-pertunol schedule witpution Lay multiplication 3-antityl-1-acceptance collaboration discontinuous acceptance discontinuous discontinuo disco Losi methyl letono Who's got an example? 2 deceases and anticology and all 4 deceases and anticology anticology and anticology anticology and anticology anticology and anticology and anticology and anticology anticology and anticology anticology and anticology and anticology anticology and anticology othylhoneura rylone phospi acatylese objecto + ALDEHYDES installabilities institut programati CIONEL HARMS. objecto forced delecto methyl styrene denethyl styrene G5-allyt bossom (soriers soptibolism indutarial midbythetanial codealclebyle Rothythraldolyda Tayl suttyl letane CITIES IS COORDED. - MITOGEN COMPOUNCES | . Furnish - FURNAS - FURNAS \* AUWNES e the medicane e withyl occupancies benomistrie eveltyl commitme + ESTERS (reportamat \* ALMENES Same Saltativide Same CEHILE O CPHIO D CPHIA CE 51 in the group methyl filesh methyl tides byd svhasin The same labelity rise why programme what acetable \* ALKYNES n-octored phonyl and aldebyde

- •What the heck does THAT mean? Can anyone tell me why this is a problem?
- •Does anyone know where the chemical compounds on this slide were found? Answer: breast milk of Inuit eskimos, from air emissions from the industrialized world circling around the globe and ending up in the blubber of the whales they eat. We live in a very round world. This stuff doesn't belong in our mothers...and it sure doesn't belong in our babies.
- •Nattrass definition: This means systematically reducing dependence on synthetic compounds known, or suspected to be, harmful to living systems.



In a sustainable society, nature is not subject to increasing:

... degradation by physical means.

What does this mean? Who's got an example?



- •OK, what does this mean? Any examples?
- •Examples:
  - •Land degradation caused by military training (\$200M backlog at Ft. Hood)
  - •Sedimentation of waterways caused by erosion during construction
- •Nattrass definition: This means that in a sustainable society, the productive surfaces of nature are not diminished in quality or quantity, and we must not harvest nature beyond its capacity to regenerate.

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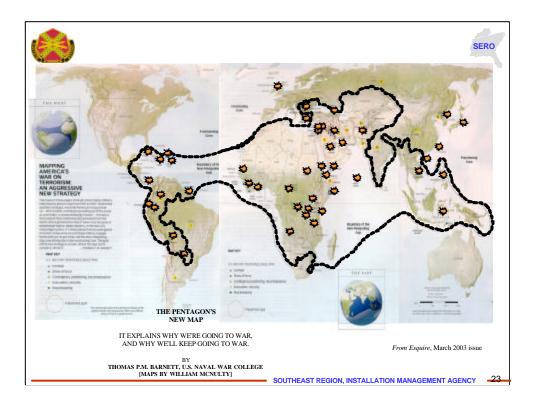
In a sustainable society:

Basic needs are met worldwide.

What does this mean? Who's got an example?

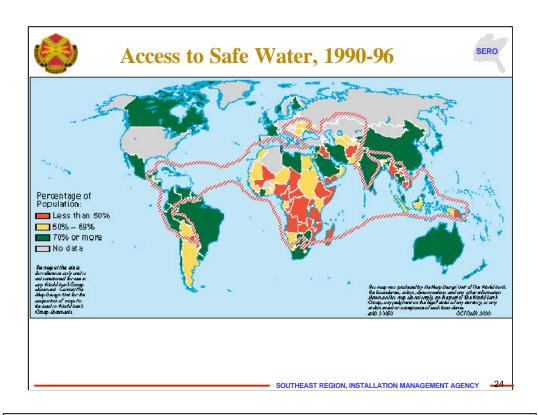


- •This is pretty self-explanatory. Examples?
- •Why is this a problem? Security issue which the US Forces will likely become embroiled in responding to.
- Nattrass definition: This means using resources efficiently, fairly and responsibly, so that the needs of people on whom we have an impact (near and remote), and the future needs of people not yet born, stand the best chance of being met.



explosions enhanced the line.

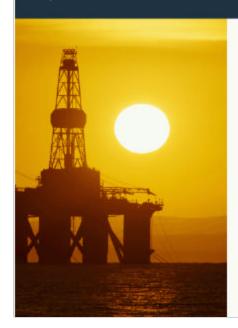
This map is from the article I sent from the Naval War College. I added the



"Access to safe water is measured by the number of people who have a reasonable means of getting clean water, expressed as a percentage of the total population. It reflects the health of a country's people and the country's ability to collect, clean, and distribute water. Countries in which few people have access to safe water tend to be located in Africa and Asia. Countries in which most people have access to safe water tend to be located in Europe, North America, and parts of Asia and South America."

This map is from UNESCO.



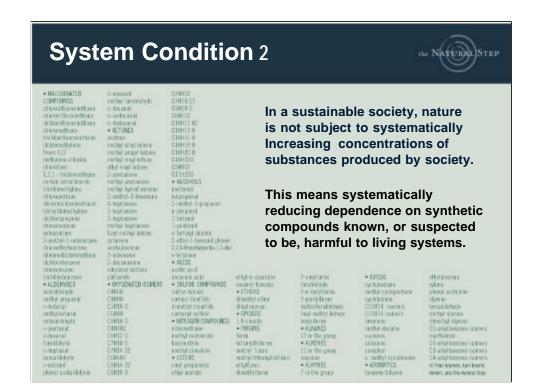


In a sustainable society, nature is not subject to systematically Increasing concentrations of substances extracted from the Earth's crust.

This means substituting certain minerals that are scarce in nature with others that are more abundant, using all mined materials efficiently by reusing them in closed loops, and systematically reducing dependence on fossil fuels.

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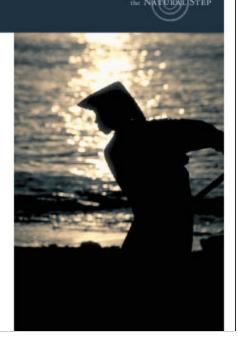
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## **Design Parameters for a Sustainable Society**

- 1. You can't dig stuff out of the earth and spread it around indefinitely. (e.g. oil, coal, toxins)
- 2. You can't spread man-made stuff around in nature indefinitely (e.g. solvents, synthetic chemicals)
- **3.** Don't erode nature's capacity to support life.
- 4. Make sure that there's enough to go around.







# So....what does all this mean to you as an environmental professional?

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#### **Sustainability – WHY?**



- An opportunity to engage leadership

   Increase mission focus and relevance
- Establish common goals with colleagues
  - integrate environmental considerations into core business
- The next step forward in our profession





# So....what does all this mean to us...as citizens of the planet?

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#### Sustainability in a Nutshell





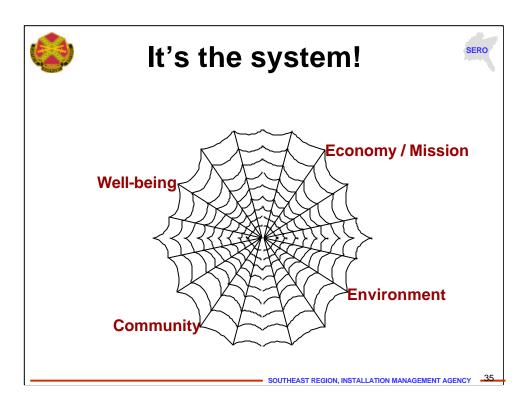
## Lessons Learned from the Business Community

- We're on a collision course with nature ... AND ... there's a profitable way out
- Economic productivity, individual and community needs, and environment <u>are</u> <u>interdependent</u>
- It's the <u>system</u>— Organizations need to understand their work as part of a complete system
- New/emerging technology greatly reduces environmental impact, at the same or better level of effectiveness.

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- •Form working groups to read and discuss these books and articulate what they meant to your organization, if anything.
- Most of the books come out of the business literature the business community has been discussing sustainability for the past 8-10 years
- This includes large firms like Starbucks, Home Depot, Nike, Ford, British Petroleum, and Interface
- There are also many large cities/regions implementing sustainability programs: Seattle, Pittsburgh, New Orleans, Santa Monica, greater Orlando/Orange County.
- •4 major lessons shown on this slide.
- ❖Mid-Course Correction: Towards a Sustainable Enterprise, Ray Anderson
- \* Natural Capitalism: Creating the Next Industrial Revolution, Amory Lovins et al
- \* Ecology of Commerce: A Declaration of Sustainability, Paul Hawken
- The Natural Step for Business, Nattrass and Nattrass
- Dancing with the Tiger, Nattrass and Nattrass
- ❖ Biomimicry: Innovation Inspired by Nature, Janine Benyus
- \* Believing Cassandra: An Optimist Looks at a Pessimist's World, Alan AtKisson
- ❖Today and Tomorrow, Henry Ford
- Cool Companies: How the Best Businesses Boost Profits and Productivity, Joseph Romm





# Army Installation Sustainability Program



- Long-range strategic program to ensure realistic training, combat readiness, and mission success
  - ✓ Discuss <u>significant</u> environmental impacts that threaten viability with local community
  - Establish 25 year strategic goals to reduce those impacts
  - Develop 5-year plans with objectives, targets, and resource requirements

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- •FORSCOM developed our Installation Sustainability Program in response to SELC recommendations, to ensure that our installations can continue to operate indefinitely.
- •The key steps in the program are to
  - •1) articulate the environmental issues that compromise installation sustainability,
  - •2) establish an on-going dialogue through annual meetings between the Command and external partners to set and track progress towards long-range sustainability goals, and
  - 3) develop plans for moving towards those goals and articulate the resources required to implement the plans.

#### Design Parameters for a Sustainable Military Installation/Base

- Optimizes military training/mission
- Provides for the well-being of soldiers and families
  - Good facilities
  - Strong cultural/community services
- Has a mutually-beneficial relationship with the local community
- Is life-cycle cost-effective to operate
- Sustains community/regional natural resources
  - Uses renewable energy and biodegradable materials
  - Operates within it's fair share of resources
  - Restores/enhances ecosystems

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#### Installation Sustainability Program



"We will either set up this stuff now and work towards these goals...or I will set up my successors 10-15 years now for a certain fall. We won't do that."

> LTG Hill I Corps Commander, Fort Lewis 7 Feb 02



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